

1 18. (As Filed) A recording media as in claim 17, wherein the highly tetrahedral  
2 amorphous carbon of the protective layer includes more than about 35%  $sp^3$  carbon-carbon bonds.

1 19. (As Filed) A recording media as in claim 17, wherein the highly tetrahedral  
2 amorphous carbon of the protective layer includes more than about 70%  $sp^3$  carbon-carbon bonds.

1 20. (As Filed) A recording media as in claim 17, wherein the  $sp^3$  carbon-carbon bonds are  
2 at least in part formed by directing an energized stream of carbon ions toward the substrate.

1 21. (As Filed) A recording media as in claim 17, wherein the density of the protective  
2 layer is more than 2.5 g/cm<sup>3</sup>.

1 22. (As Filed) A recording media as in claim 17, wherein the highly tetrahedral  
2 amorphous carbon of the protective layer does not include macroparticles.

1 23. (As Filed) A recording media as in claim 17, wherein the protective layer has a  
2 hardness of over about 50 GPa.

1 24. (As Filed) A recording media as in claim 17, wherein the protective layer has a  
2 thickness of less than about 75Å.

1 25. (As Filed) A recording media as in claim 17, wherein the highly tetrahedral  
2 amorphous carbon of the protective layer further comprises hydrogen.

1 26. (As Filed) A recording media as in claim 25, wherein the protective layer comprises  
2 between about 8 and 18 atomic percent hydrogen.

1 27. (As Filed) A recording media as in claim 17, wherein the highly tetrahedral  
2 amorphous carbon of the protective layer further comprises nitrogen.

28. (Amended) A recording media as in claim 27 [26], wherein the  
protective layer comprises between about 4 and 30 atomic percent nitrogen.

29. (As Filed) A method for enhancing an ion beam, the ion beam produced by  
inductively ionizing a plasma within a plasma volume and capacitatively coupling the plasma so as to form a  
stream of ions from within the plasma volume, the method comprising:  
moving a magnetic field through the plasma volume to promote even resonant inductive  
ionization and homogenize the ion beam.

1 30. (As Filed) A method as claimed in claim 29, wherein moving the magnetic field  
2 comprises selectively energizing magnetic coils disposed about the plasma volume.

1 31. (As Filed) A method as claimed in claim 29, wherein the magnetic field rotates  
2 through the plasma volume with a frequency which is much less than the frequency of an alternating induction  
3 potential.

1 32. (As Filed) A method as claimed in claim 29, wherein the magnetic field is transverse  
2 and rotates about an axis which is substantially normal to a capacitatively coupled extraction grid.

1 33. (As Filed) A method as claimed in claim 29, wherein the magnetic field rotates with a  
2 frequency of less than 10,000 Hz.

1 34. (As Filed) An inductive ionization resonance system for use with an ion-beam source  
2 including an antenna disposed about a plasma volume for inductively ionizing a plasma therein, a coupling  
3 electrode exposed to the plasma volume, and an extraction electrode disposed over an opening of the plasma  
4 volume so that the extraction electrode is capable of extracting a stream of ions of the plasma therethrough by  
5 capacitive coupling, the system comprising at least one coil disposed adjacent the plasma volume, the at least one  
6 coil capable of moving a transverse magnetic field through the plasma volume to homogenize the stream of ions.

1 35. (As Filed) A system as claimed in claim 34, further comprising a plurality of coils  
2 disposed about the container so that the magnetic field can be moved within the plasma volume by selectively  
3 energizing one or more coils.

1 36. (As Filed) A system as claimed in claim 35, wherein the plurality of coils are radially  
2 disposed about the axis.

1 37. (As Filed) A system as claimed in claim 34, wherein the plasma volume substantially  
2 defines a length and a diameter, wherein the opening is disposed at one end of the length, and wherein the length  
3 is between about one third the diameter and three times the diameter.

Please add new claims 38-47

1 -- 38. (New) An apparatus comprising:  
2 a substrate; and

B2  
Sub  
C2

3 a layer disposed over the substrate, the layer comprising a highly tetrahedral  
4 amorphous carbon having more than about 15%  $sp^3$  carbon-carbon bonds, the layer further  
5 comprising at least one of hydrogen and nitrogen.

1 39. (New) An apparatus as in claim 38, wherein the layer comprises  
2 between about 8 and 18 atomic percent hydrogen.

1 40. (New) An apparatus as in claim 38, wherein the layer comprises  
2 between about 4 and 30 atomic percent nitrogen.

1 41. (New) An apparatus as in claim 38, wherein electrical conductivity of  
2 the layer varies.

1 42. (New) An apparatus as in claim 41, wherein the electrical conductivity  
2 of the layer varies by 5 orders of magnitude.

1 43. (New) An apparatus as in claim 38, wherein the  $sp^3$  carbon-carbon  
2 bonds are stable at about 700°C.

1 44. (New) An apparatus as in claim 38, wherein the layer is smooth and  
2 continuous.

1 45. (New) An apparatus as in claim 38, wherein the layer comprises more  
2 than about 35%  $sp^3$  carbon-carbon bonds.

1 46. (New) An apparatus as in claim 38, wherein the layer comprises more  
2 than about 70%  $sp^3$  carbon-carbon bonds.

1 47. (New) Magnetic recording media comprising:  
2 a substrate;  
3 a magnetic layer disposed over the substrate; and  
4 a protective layer disposed over the magnetic layer, the protective layer  
5 comprising a highly tetrahedral amorphous carbon having a density of more than 2.5 g/cm<sup>3</sup>.--

B-2  
Sub  
C-2  
Cont